

Dr Costa (J. M.)
observations on the salts

OBSERVATIONS ON THE SALTS OF NICKEL, ESPECIALLY THE BROMIDE OF NICKEL.

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Nickel and its salts have been very little employed in medicine. I cannot, indeed, find that they have ever been subjected to systematic study. Simpson made some slight trials with the sulphate of nickel, and thought it a gentle tonic, and useful in a case of severe and obstinate periodic headache; and I observe, in the last edition of the *U. S. Dispensatory*, that Dr. Palmer, of Florida, has made use of the same salt, and has reported it to be a sedative and soporific, and of avail when opium is not admissible. In the number of the *Lancet*, for January 27th of this year, Broadbent alludes to the salts of nickel having an action on the blood, and refers to a previous paper in the *Clinical Society's Transactions*, vol. ii., in which I find that nickel was given associated with iron or other tonics.

Our information about nickel and its salts is thus very slim, and when I began its employ, about a year ago, I was not aware that even this slight knowledge existed. The preparations which I have tested were made for me with great care by Mr. McKelway, and leave, in purity, nothing to be desired. He has made the chlo-



ride, the sulphate, the acetate, the phosphate, the bromide; but after investigating them all, I have settled down on the sulphate and the bromide as the best preparations. And in this paper, which is to be looked upon merely as a preliminary one, I shall give some of the results I have arrived at with reference to them.

As regards the sulphate, the preparation I employed was made by digesting nickel filings in dilute sulphuric acid and evaporating. A salt results of a chrome green color, very deliquescent, and very soluble in water. I used it in solution from one to three grains; sometimes in pill. I found it, in the smaller dose, well borne by the stomach; I have given it up to five grains, but it then, in some persons, occasions giddiness and nausea. In this dose it has no decided effect on the pulse or temperature, perhaps lowering the former somewhat in frequency and slightly reducing the latter. Of its soporific effect I saw no evidence, but I have known sulphate of nickel prove something of an anodyne; for in a case of subacute rheumatism at the Pennsylvania Hospital, in which it had been stopped, the patient asked to have it prescribed again, as his pains were much relieved while taking it. Of its striking tonic effect I cannot say that I have seen any proof. I have tested it carefully for night sweats, and found its action only very slight. But I have had some excellent results with it in small, frequently repeated doses, or in doses from one to two grains four times daily, in cases of obstinate diarrhoea. In one such case, a man at the Pennsylvania Hospital affected with trembling associated with beginning sclerosis and valvular disease of the heart, it proved successful after many remedies had failed. Continuing it subsequently, the heart grew more regular; the nervous phenomena remained the same. In some instances of chronic catarrh of the stomach it has seemed to me to do much good, but in this respect the chloride answers even better. In the case of a professional man with marked

indigestion and some albumen in the urine, in whom iron produced headache and otherwise disagreed, the digestive disorder was speedily influenced, and the albumen disappeared while taking one grain of the chloride three times daily. More than this did not agree. It had also a calming influence on the nervous system, and this has been mentioned to me also in other instances, both from the chloride and the sulphate. I have tried the sulphate in some cases of typhoid fever in which diarrhœa was a prominent symptom. But while not having tested it sufficiently to have formed a positive opinion, I may say that its action was far less than I had anticipated, and that it disappointed me.

With reference to the bromide of nickel, which I do not think has been before employed in medicine, I have made a number of observations, and should have completed many more had it not been for the occasional giving out of the supply in the midst of them. The specimens which I had were very pure. They were made by digesting nickel filings in bromine and water, and evaporating carefully to crystallization. The salt is green in color, deliquescent, and soluble in water, and in the dose in which it is necessary to give it, is not offensive to the stomach. The skilled pharmacist who made these nickel preparations for me has prepared a syrup mixed with orange-flower water which is readily taken. A dessertspoonful contains five grains. He has also made some compressed pills of similar strength, but these do not keep well. Yet the remedy may be prescribed in the form of pill made with gum tragacanth. In using bromide of nickel I soon saw that I obtained from it the effects of the other bromides, but the effect came from very much smaller doses. Thus I find five grains to seven and a half grains an average dose; ten a decided one. And, when this is indicated, it is best to give five grains soon repeated, as less likely to disturb the stomach,

The influence on the nervous system, of the bromide of nickel, is shown by its relieving headache, especially of the congestive form, in its effects on convulsive movements, and its general quieting tendencies. But the main question to be solved was: Does it prove of service in epilepsy? I found it acted quite as well as any bromide, and, as happens with all, we sometimes by a change to it obtain results which the others no longer yield. It is unnecessary to go into the details of many cases; but I will select a few illustrative ones. First that of a laborer, forty years of age, who has been under observation since February, 1881, at the clinic of the Jefferson Medical College. Dr. Hughes, the chief clinical assistant, who greatly interested himself in procuring an accurate history of the malady, found that it dated from 1865, since which time the man had had severe attacks of epilepsy, as many as three or four daily, and never less than two a week. There was no apparent cause for the affection; no history of epilepsy or kindred malady in the family; no injury or severe illness; no sunstroke; no syphilis; no signs of cerebral tumor. Ordinary doses of the bromides were found to be totally ineffectual, and bromide of potassium and bromide of sodium each thirty grains, with a few grains of iodide of potassium, were given three times daily; also two minims of Fowler's solution thrice daily. This treatment was continued for a month, when signs of bromism became marked; the dose was lessened one-half, and then given for another month. The result was that during the first month he had four severe attacks each week; during the second month one or two daily. Placed subsequently on biborate of sodium, ten grains three times daily, and kept on it for months, the effect was a decided reduction in the number of the attacks; but the improvement was not permanent; the seizures became as bad and as frequent as ever, and after trying various remedies he had to go back to the bromides to obtain any kind of relief, yet there was still

no week without several fits. In December, 1882, he was placed upon nickel bromide, five grains three times daily, and for two weeks had no attack; during the six weeks in which the drug was taken, he had but five. Unfortunately, at that time the supply gave out.

A yet more striking case was that of I. S., a laborer, twenty years of age, also under treatment at the clinic. When seen in March, 1881, he had been subject to epilepsy for fourteen years without discoverable cause. Two months was the longest period without an attack; for the three years previous to applying at the clinic, he had been having two attacks weekly. Strychnia was at first very beneficial, but ultimately lost its effect entirely, and he had two or three fits daily. Twenty grains of bromide of potassium with ten of biborate of sodium, given three and subsequently four times daily, kept the attacks down to about one a month. In December, 1882, nickel bromide, five grains, three times daily, was substituted and kept up for nine weeks; during which time he had no attack.

In the case of Alice S., a colored woman, fifty years of age, at the Pennsylvania Hospital, epileptic seizures had been going on since the age of thirty. The fits happened at intervals of about a week, and always in the way that three or four occurred in one day, and then she had a week's freedom from them. She was always much improved by treatment, especially by the bromides; but when this was neglected the seizures returned in their original severity. When admitted into the hospital, they were of weekly occurrence, three or four in one day. There was no history of specific affection; the urine was normal, and disease of any organ could not be found. Bromide of nickel was administered in five-grain doses three times daily during the first week. The remedy produced no gastric disturbance, the appetite was not interfered with, and the bowels con-

tinued regular. The temperature record carefully kept during this period by Dr. Grayson, showed a slight depression below the normal. At the end of the week there was no recurrence of the epileptic attacks. During the following week the remedy was increased to seven and a-half grains at a dose; and this period also passed without any return of the convulsions. Ten grains were now administered three times daily, and for the succeeding ten days the woman continued free from any manifestation of her disease. At the end of this time, however, the controlling power of the nickel became less; the fits returned, although they were fewer and of brief duration. Bromide of potassium was then given, under which they remained as just mentioned. During the whole time of the administration of the nickel, there was no appreciable effect upon the heart's action; the urine was repeatedly examined and found free from abnormal ingredients, nor was there any alteration in the quantity or the composition.

Some of the points mentioned in this case, I have studied also in others, such as the effect on temperature, on the circulation, and on the secretions. But my observations are as yet not complete enough to warrant the enunciation of definite results. Yet I think I am right in concluding that bromide of nickel slightly lowers the temperature, has little or no influence on the pulse, if any, rendering it somewhat slower; and does not act on the skin or bowels, or on the composition of the urine, the quantity of which may remain normal or be slightly increased. Its effect on the nervous system is that of a sedative, without, however, producing a weakening or depressing influence.

The result shown from a smaller dose than that of the bromides which are generally employed, is a striking feature. Nor can this be accounted for by the bromide of nickel having in its combination

a greater percentage of bromine. The combining weight of nickel is higher than that of sodium. Sodium is 23.3; nickel, 29.5; potassium, 39.2. There is, therefore, in the nickel bromide some special action.

Of course, this inquiry suggested a trial, in epilepsy, of some of the other salts, such as the sulphate and chloride, to see if by themselves they had any specific influence similar to the preparations of silver and of zinc, and I have prescribed these nickel salts to epileptics for some weeks before beginning with the bromide. The result was, the patients had rather fewer attacks. But while not inert, no striking influence was exerted by the drug; certainly nothing that compared with the bromide salt.

In conclusion, it seems to me that the preparations of nickel, especially the bromide, will be found additions to our therapeutic resources; and are certainly worthy of more careful study than they have hitherto received.

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